

CLAIMS

1. A handling device for boxes and the like for repeatedly presenting the top box of a first stack (11) of boxes at a predetermined height and making it possible to remove said top box in such a way that the boxes removed from the first stack (11) gradually form a second stack (12), this device comprising:
  - a first vertically movable support (9) for receiving said first stack (11);
  - 10 - a second vertically movable support (10) for receiving said second stack (12); and
  - means for synchronously driving the first and second supports (9, 10) so that when one goes up the other goes down and vice versa; which handling device is
- 15 characterized in that it further includes a first lateral upright (2) and a second lateral upright (3) separate from the first upright (2) each provided with a slideway (7, 8), the first support (9) being mounted on the slideway (7) of the first upright (2) and the second support (10) being mounted on the slideway (8) of the second upright (3), the device being adapted to leave free the gap between the second upright (3) and said top box of the first stack (11) at the predetermined height so that the top box of the first stack (11) is
- 20 transferred directly to the second stack (12) by lateral displacement at a more or less permanent level.
- 25 2. Handling device according to claim 1, characterized in that the supports (9, 10) are further adapted to occupy a mid-height position in which they are disposed face-to-face at more or less the same level.
- 30 3. Handling device according to either claim 1 or claim 2, characterized in that the synchronized drive means include a cable (15) each of the ends whereof is connected to a respective one of the supports (9, 10) and which travels along a guide path (4, 5, 6) including two

bottom idler pulleys (18, 19) each disposed at the base of a respective one of the lateral uprights (2, 3) and two top idler pulleys (16, 17) each disposed at the top of a respective one of the lateral uprights (2, 3), the 5 portion (4) of the guide path situated between the bottom idler pulleys (18, 19) being substantially horizontal and disposed under said supports (9, 10) so that the assembly formed by the two supports (9, 10) is partially surrounded by the guide path (4, 5, 6).

10 4. Handling device according to any one of claims 1 to 3, characterized in that it further includes at least one motor (14) co-operating with transmission means (13) connected to the synchronized drive means.

15 5. Handling device according to claim 4, characterized in that said transmission means (13) connect the motor (14) to one of the supports (9, 10) so that the movement of said support (9) are driven directly by the motor (14), the movement of the other support (10) being driven by the synchronized drive means.

20 6. Handling device according to either claim 4 or claim 5, characterized in that said transmission means include a transmission screw (13) adapted to be driven in rotation by the motor (14), the support (9) being connected to a threaded member meshing with the 25 transmission screw (13).

30 7. Handling device according to any one of claims 3 to 6, characterized in that at least one of the idler pulleys (16, 17, 18, 19) is mounted on a mobile shaft allowing movement of the pulley and modification of the length of the guide path (4, 5, 6).

35 8. Handling device according to claim 7, characterized in that one of the top idler pulleys (16, 17) is mounted so as to be mobile substantially vertically relative to the corresponding lateral upright (2, 3).

9. Handling device according to either claim 7 or claim 8, characterized in that one of the top idler pulleys (16, 17) is connected to a threaded member meshing with an adjuster screw (20) rotatably mounted on 5 the corresponding lateral upright (2, 3), the adjuster screw (20) being connected to drive means (21) accessible from said lateral upright (2, 3).

10. Handling device according to any one of claims 1 to 9, characterized in that it further includes 10 a control module (22) for the synchronized drive means and at least one sensing member (23, 24) connected to said control module (22), which is adapted to control the synchronized drive means as a function of indications supplied by the sensing member (23, 24).

15 11. Handling device according to claim 10, characterized in that it includes a member (24) for sensing the height of the first stack (11).

12. Handling device according to either claim 10 or claim 11, characterized in that it includes a member 20 (24) for sensing the height of the second stack (12).

13. Handling device according to any one of claims 10 to 12, characterized in that it includes at least one support sensing member (23) adapted to supply 25 an indication to the control module (22) when the two supports (9, 10) are face-to-face.

14. Handling device according to any one of claims 1 to 13, characterized in that it includes a safety stop member (27) mounted under at least one of said supports (9, 10) and including stop means for the 30 supports (9, 10).

15. Handling device according to claim 1, characterized in that the synchronized drive means include two motors (28) each disposed on one of the lateral uprights (2', 3').

35 16. Handling device according to claim 15,

characterized in that the supports (9', 10') are further adapted to occupy a high position in which they are disposed face-to-face at more or less the same level.

17. Handling device according to either claim 15  
5 or claim 16, characterized in that each support (9', 10') is attached to the first end of a flexible connection (29) whose second end is attached to the motor (28) so that winding in of the second end of the flexible connection (29) by the motor (28) raises the support (9',  
10 10').

18. Handling device according to claim 17,  
characterized in that the motor (28) includes a winder  
(30) adapted to enable the second end of the flexible  
connection (29) to be wound up on itself by the motor  
15 (28) so that during winding the winding diameter  
increases.

19. Handling device according to claim 18,  
characterized in that the flexible connection (29)  
includes a strap forming the second end of the flexible  
20 connection (29).

20. Handling device according to any one of  
claims 15 to 19, characterized in that it further  
includes a control module (22') of the synchronized drive  
means and at least one sensing member (23', 24')  
25 connected to said control module (22'), which controls  
the synchronized drive means as a function of the  
indications supplied by the sensing member (23', 24').

21. Handling device according to claim 20,  
characterized in that it includes two sensing members  
30 (24') each disposed on one of the lateral uprights (2',  
3') and each adapted to sense the height of the  
corresponding stack.